

At September 3, 1993, now U. S. Patent No. 5,326,428, issued July 5, 1994; the
disclosures of which are incorporated by reference.--

In the Claims

Please replace the claims with the following clean version of the entire set of pending claims, in accordance with 37 C.F.R. § 1.121(c)(1)(i).

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31. (New) A removable electrical interconnect apparatus for removably engaging electrically conductive pads on a semiconductor substrate having integrated circuitry fabricated therein, the apparatus comprising:
a substrate; and
an engagement probe projecting from the substrate to engage a single conductive pad on a semiconductor substrate having integrated circuitry formed in the semiconductor substrate, the engagement probe having an outer surface comprising an apex in the form of at least one knife-edge line sized and positioned to engage the single conductive pad.

32. (New) The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed on a projection from the substrate.

33. (New) The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line projects from a penetration stop plane.

Aa
cont.

34. (New) The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line projects from a penetration stop plane, the knife-edge line having a tip and a having a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

35. (New) The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed on a projection from the substrate, the knife-edge line projecting from a penetration stop plane on the projection.

36. (New) The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed on a projection from the substrate, the knife-edge line projects from a penetration stop plane on the projection, the knife-edge line having a tip and a having a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

A2
cont.

37. (New) The removable electrical interconnect apparatus of claim 31 wherein outermost portions of the electrically conductive apexes constitute a first electrically conductive material, and wherein the conductive pads for which the apparatus is adapted have outermost portions constituting a second electrically conductive material; the first and second electrically conductive materials being different.

38. (New) The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed from a semiconductor substrate.

39. (New) The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line includes an outer conductive layer.

40. (New) The removable electrical interconnect apparatus of claim 31 wherein the outer surface includes plural knife-edge lines configured to engage the single conductive pad.

41. (New) The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed from a semiconductor substrate and the outer surface includes plural knife-edge lines configured to engage the single conductive pad.

A2
cont.

42. (New) The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed from a semiconductor substrate and the outer surface includes plural knife-edge lines configured to engage the single conductive pad and the knife-edge lines include outer conductive layers.

43. An engagement probe formed from a semiconductor material and having a grouping of a plurality of projecting apexes positioned in sufficient proximity to one another to collectively engage a single conductive pad on a semiconductor substrate.

44. (New) The engagement probe of claim 43 comprising a plurality of such groupings for engaging multiple conductive pads on the semiconductor substrate.

45. (New) The engagement probe of claim 43 wherein the apexes are in the shape of multiple knife-edge lines.

46. (New) The engagement probe of claim 43 wherein the apexes are in the shape of multiple knife-edge lines, the multiple knife-edge lines being positioned to form at least one polygon.

A2
Cont.

47. (New) The engagement probe of claim 43 wherein the apexes are in the shape of multiple knife-edge lines, the multiple knife-edge lines being positioned to form at least two polygons one of which is received entirely within the other.

48. (New) The engagement probe of claim 43 wherein the grouping of apexes is formed on a projection from a substrate.

49. (New) The engagement probe of claim 43 wherein the apexes have a selected projecting distance, the projecting distance being about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

50. (New) The engagement probe of claim 43 wherein the apexes project from a common plane, the apexes having respective tips and bases, the bases of adjacent projecting apexes being spaced from one another to define a penetration stop plane therebetween.

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cont.

51. (New) The engagement probe of claim 43 wherein the apexes project from a common plane, the apexes having respective tips and bases, the bases of adjacent projecting apexes being spaced from one another to define a penetration stop plane therebetween, the tips being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

52. (New) The engagement probe of claim 43 wherein the apexes are in the shape of multiple knife-edge lines, the multiple knife-edge lines interconnecting to form at least one fully enclosed polygon.

53. (New) The engagement probe of claim 43 wherein outermost portions of the electrically conductive apexes constitute a first electrically conductive material, and wherein the conductive pads for which the probe is adapted have outermost portions constituting a second electrically conductive material; the first and second electrically conductive materials being different.

54. (New) A removable engagement probe having an outer surface comprising an apex in the form of at least one knife-edge line sized and positioned to engage a single conductive pad.

55. (New) The removable engagement probe of claim 54 wherein the at least one knife-edge line is formed on a projection from a substrate.

56. (New) The removable engagement probe of claim 54 wherein the knife-edge line projects from a penetration stop plane.

57. (New) The removable engagement probe of claim 54 wherein the knife-edge line projects from a penetration stop plane, the knife-edge line having a tip and a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

58. (New) The removable engagement probe of claim 54 wherein the knife-edge line is formed on a projection from a substrate, the knife-edge line projecting from a penetration stop plane on the projection.

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Conc.

59. (New) The removable engagement probe of claim 54 wherein the knife-edge line is formed on a projection from a substrate, the knife-edge line projects from a penetration stop plane on the projection, the knife-edge line having a tip and a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

60. (New) The removable engagement probe of claim 54 wherein outermost portions of the electrically conductive apexes constitute a first electrically conductive material, and wherein the conductive pads for which the probe is adapted have outermost portions constituting a second electrically conductive material, the first and second electrically conductive materials being different.

61. (New) The removable engagement probe of claim 54 wherein the probe is fabricated from a semiconductor substrate.